CLAIMS

1. A method for improved coded excitation of ultrasound beams, said method comprising:

encoding a first ultrasound beam with a first code;

transmitting said first ultrasound beam on a first path;

encoding a second ultrasound beam with a second code;

transmitting said second ultrasound beam on a second path; and

receiving echo signals from said first and second ultrasound beams.

2. The method of claim 1, wherein said first and second codes comprise Golay codes.

3. The method of claim 1, wherein said first path and said second path comprise adjacent scan lines.

4. The method of claim 1, further comprising matched filtering of said echo signals.

5. The method of claim 1, further comprising lateral filtering across echo signals from adjacent scan lines.

6. The method of claim 5, wherein said lateral filtering comprises at least one of a lateral averaging filtering and a higher order finite impulse response filtering.

7. The method of claim 1, wherein said first and second ultrasound beams are encoded in first and second transmit focal zones and transmitted on said first path and said second path, wherein said first path equals said second path.

8. The method of claim 7, further comprising:

match filtering said echo signals received from said first and second ultrasound beams; and

averaging between said first and second transmit focal zones.

9. A method for single transmission coded excitation of signals, said method comprising:

encoding a plurality of signals with a plurality of complimentary codes;

transmitting said plurality of signals on a plurality of paths; and

processing echo signals produced from said plurality of signals.

10. The method of claim 9, wherein said codes comprise Golay codes.

11. The method of claim 9, further comprising filtering said echo signals.

12. The method of claim 9, further comprising match filtering said echo signals with corresponding matched filters.

13. The method of claim 9, further comprising lateral filtering a plurality of echo signals to form an image data signal.

14. An improved ultrasound imaging system for transmitted coded ultrasound signals, said system comprising:

a waveform generator for generating waveforms for a plurality of ultrasound signals, wherein said waveform generator encodes said waveforms for a plurality of ultrasound signals;

a transducer for transmitting ultrasound beams based on said waveforms along a plurality of beam paths, said transducer capable of receiving echo signals in response to said ultrasound beams; and

a decoder for converting said echo signals to image data.

15. The system of claim 14, wherein said waveform generator encodes said plurality of ultrasound signals with Golay codes.

16. The system of claim 14, wherein said waveform generator encodes said plurality of ultrasound signals with complimentary codes.

17. The system of claim 14, wherein said decoder further comprises a matched filter for filtering said echo signals.

18. The system of claim 14, wherein said decoder further comprises at least one of a lateral averaging filter and a finite impulse response filter.

19. The system of claim 14, further comprising a beamformer for forming said ultrasound beams from said waveforms.

20. The system of claim 19, wherein said beamformer further comprises a multi-line beamformer, wherein said multi-line beamformer receives a plurality of echo signals in response to an ultrasound signal.

21. The system of claim 14, further comprising a memory capable of storing at least one of said waveforms and said echo signals.

22. The system of claim 14, further comprising a system controller for controlling an imaging mode and parameters of said system.

23. The system of claim 14, wherein said waveform generator encodes first and second ultrasound beams with first and second complimentary Golay codes, wherein said transducer transmits said first and second ultrasound beams in first and second focal zones along a beam path, wherein said decoder match filters echo signals received in response to said first and second ultrasound beams and averages said echo signals between said first and second focal zones.